<110>   Bichko, Vadim

<120>   HEPATITIS C VIRUS CONSTRUCTS CHARACTERIZED BY HIGH EFFICIENCY
REPLICATION

<130>   0342/1H395US1

<140>   US 10/005,469
<141>   2001-11-07

<150>   US 60/245,866
<151>   2000-11-07

<160>   14

<170>   PatentIn version 3.1

<210>   1
<211>   7992
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   HCV1b-based chimeric replicon

<400>   1

```
gccagccccc gattgggggc gacactccac catagatcac tcccctgtga ggaactactg      60

tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgtcgtgcag cctccaggac     120

cccccctccc gggagagcca tagtggtctg cggaaccggt gagtacaccg gaattgccag     180

gacgaccggg tcctttcttg gatcaacccg ctcaatgcct ggagatttgg gcgtgccccc     240

gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtact gcctgatagg     300

gtgcttgcga gtgccccggg aggtctcgta daccgtgcac catgagcacg aatcctaaac     360

ctcaaagaaa aaccaaaggg cgcgccatga ttgaacaaga tggattgcac gcaggttctc     420

cggccgcttg ggtggagagg ctattcggct atgactgggc acaacagaca atcggctgct     480

ctgatgccgc cgtgttccgg ctgtcagcgc agggggcgccc ggttcttttt gtcaagaccg     540

acctgtccgg tgccctgaat gaactgcagg acgaggcagc gcggctatcg tggctggcca     600

cgacgggcgt tccttgcgca gctgtgctcg acgttgtcac tgaagcggga agggactggc     660
```

tgctattggg cgaagtgccg gggcaggatc tcctgtcatc tcaccttgct cctgccgaga   720

aagtatccat catggctgat gcaatgcggc ggctgcatac gcttgatccg gctacctgcc   780

cattcgacca ccaagcgaaa catcgcatcg agcgagcacg tactcggatg gaagccggtc   840

ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcgccagcc gaactgttcg   900

ccaggctcaa ggcgcgcatg cccgacggcg aggatctcgt cgtgacccat ggcgatgcct   960

gcttgccgaa tatcatggtg gaaaatggcc gctttctgg attcatcgac tgtggccggc   1020

tgggtgtggc ggaccgctat caggacatag cgttggctac ccgtgatatt gctgaagagc   1080

ttggcggcga atgggctgac cgcttcctcg tgctttacgg tatcgccgct cccgattcgc   1140

agcgcatcgc cttctatcgc cttcttgacg agttcttctg agtttaaaca gaccacaacg   1200

gtttccctct agcgggatca attccgcccc tctccctccc cccccctaa cgttactggc   1260

cgaagccgct tggaataagg ccggtgtgcg tttgtctata tgttattttc caccatattg   1320

ccgtctttg gcaatgtgag ggcccggaaa cctggccctg tcttcttgac gagcattcct   1380

aggggtcttt ccctctcgc caaaggaatg caaggtctgt tgaatgtcgt gaaggaagca   1440

gttcctctgg aagcttcttg aagacaaaca acgtctgtag cgacccttg caggcagcgg   1500

aaccccccac ctggcgacag gtgcctctgc ggccaaaagc cacgtgtata agatacacct   1560

gcaaaggcgg cacaaccca gtgccacgtt gtgagttgga tagttgtgga aagagtcaaa   1620

tggctctcct caagcgtatt caacaagggg ctgaaggatg cccagaaggt accccattgt   1680

atgggatctg atctggggcc tcggtgcaca tgctttacat gtgtttagtc gaggttaaaa   1740

aacgtctagg ccccccgaac cacggggacg tggtttttcct ttgaaaaaca cgataatacc   1800

atggcgccta ttacggccta ctcccaacag acgcgaggcc tacttggctg catcatcact   1860

agcctcacag gccgggacag gaaccaggtc gaggggggagg tccaagtggt ctccaccgca   1920

acacaatctt tcctggcgac ctgcgtcaat ggcgtgtgtt ggactgtcta tcatggtgcc   1980

ggctcaaaga cccttgccgg cccaaagggc ccaatcaccc aaatgtacac caatgtggac   2040

caggacctcg tcggctggca agcgcccccc ggggcgcgtt ccttgacacc atgcacctgc   2100

ggcagctcgg acctttactt ggtcacgagg catgccgatg tcattccggt gcgccggcgg   2160

```
ggcgacagca ggggggagcct actctccccc aggcccgtct cctacttgaa gggctcttcg    2220

ggcggtccac tgctctgccc ctcggggcac gctgtgggca tctttcgggc tgccgtgtgc    2280

acccgagggg ttgcgaaggc ggtggacttt gtacccgtcg agtctatgga aaccactatg    2340

cggtccccgg tcttcacgga caactcgtcc cctccggccg taccgcagac attccaggtg    2400

gcccatctac acgcccctac tggtagcggc aagagcacta aggtgccggc tgcgtatgca    2460

gcccaagggt ataaggtgct tgtcctgaac ccgtccgtcg ccgccaccct aggtttcggg    2520

gcgtatatgt ctaaggcaca tggtatcgac cctaacatca gaaccggggt aaggaccatc    2580

accacgggtg cccccatcac gtactccacc tatggcaagt ttcttgccga cggtggttgc    2640

tctggggggcg cctatgacat cataatatgt gatgagtgcc actcaactga ctcgaccact    2700

atcctgggca tcggcacagt cctggaccaa gcggagacgg ctggagcgcg actcgtcgtg    2760

ctcgccaccg ctacgcctcc gggatcggtc accgtgccac atccaaacat cgaggaggtg    2820

gctctgtcca gcactggaga aatccccttt tatggcaaag ccatccccat cgagaccatc    2880

aagggggggga ggcacctcat tttctgccat tccaagaaga aatgtgatga gctcgccgcg    2940

aagctgtccg gcctcggact caatgctgta gcatattacc ggggccttga tgtatccgtc    3000

ataccaacta gcggagacgt cattgtcgta gcaacggacg ctctaatgac gggctttacc    3060

ggcgatttcg actcagtgat cgactgcaat acatgtgtca cccagacagt cgacttcagc    3120

ctggacccga ccttcaccat tgagacgacg accgtgccac aagacgcggt gtcacgctcg    3180

cagcggcgag gcaggactgg tagggggcagg atgggcattt acaggtttgt gactccagga    3240

gaacggccct cgggcatgtt cgattcctcg gttctgtgcg agtgctatga cgcgggctgt    3300

gcttggtacg agctcacgcc cgccgagacc tcagttaggt tgcgggctta cctaaacaca    3360

ccagggttgc ccgtctgcca ggaccatctg gagttctggg agagcgtctt tacaggcctc    3420

acccacatag acgcccattt cttgtcccag actaagcagg caggagacaa cttcccctac    3480

ctggtagcat accaggctac ggtgtgcgcc agggctcagg ctccacctcc atcgtgggac    3540

caaatgtgga agtgtctcat acggctaaag cctacgctgc acgggccaac gcccctgctg    3600

tataggctgg gagccgttca aaacgaggtt actaccacac accccataac caaatacatc    3660
```

```
atggcatgca  tgtcggctga  cctggaggtc  gtcacgagca  cctgggtgct  ggtaggcgga   3720

gtcctagcag  ctctggccgc  gtattgcctg  acaacaggca  gcgtggtcat  tgtgggcagg   3780

atcatcttgt  ccggaaagcc  ggccatcatt  cccgacaggg  aagtccttta  ccgggagttc   3840

gatgagatgg  aagagtgcgc  ctcacacctc  ccttacatcg  aacagggaat  gcagctcgcc   3900

gaacaattca  aacagaaggc  aatcgggttg  ctgcaaacag  ccaccaagca  agcggaggct   3960

gctgctcccg  tggtggaatc  caagtggcgg  accctcgaag  ccttctgggc  gaagcatatg   4020

tggaatttca  tcagcgggat  acaatattta  gcaggcttgt  ccactctgcc  tggcaacccc   4080

gcgatagcat  cactgatggc  attcacagcc  tctatcacca  gcccgctcac  cacccaacat   4140

accctcctgt  ttaacatcct  gggggggatgg  gtggccgccc  aacttgctcc  tcccagcgct   4200

gcttctgctt  tcgtaggcgc  cggcatcgct  ggagcggctg  ttggcagcat  aggccttggg   4260

aaggtgcttg  tggatatttt  ggcaggttat  ggagcagggg  tggcaggcgc  gctcgtggcc   4320

tttaaggtca  tgagcggcga  gatgccctcc  accgaggacc  tggttaacct  actccctgct   4380

atcctctccc  ctggcgccct  agtcgtcggg  gtcgtgtgcg  cagcgatact  gcgtcggcac   4440

gtgggcccag  gggagggggc  tgtgcagtgg  atgaaccggc  tgatagcgtt  cgcttcgcgg   4500

ggtaaccacg  tctcccccac  gcactatgtg  cctgagagcg  acgctgcagc  acgtgtcact   4560

cagatcctct  ctagtcttac  catcactcag  ctgctgaaga  ggcttcacca  gtggatcaac   4620

gaggactgct  ccacgccatg  ctccggctcg  tggctaagag  atgtttggga  ttggatatgc   4680

acggtgttga  ctgatttcaa  gacctggctc  cagtccaagc  tcctgccgcg  attgccggga   4740

gtccccttct  tctcatgtca  acgtgggtac  aagggagtct  ggcggggcga  cggcatcatg   4800

caaaccacct  gcccatgtgg  agcacagatc  accggacatg  tgaaaaacgg  ttccatgagg   4860

atcgtggggc  ctaggacctg  tagtaacacg  tggcatggaa  cattccccat  taacgcgtac   4920

accacgggcc  cctgcacgcc  ctccccggcg  ccaaattatt  ctaggcgct   gtggcgggtg   4980

gctgctgagg  agtacgtgga  ggttacgcgg  gtgggggatt  ccactacgt   gacgggcatg   5040

accactgaca  acgtaaagtg  cccgtgtcag  gttccggccc  ccgaattctt  cacagaagtg   5100

gatggggtgc  ggttgcacag  gtacgctcca  gcgtgcaaac  ccctcctacg  ggaggaggtc   5160
```

```
acattcctgg tcgggctcaa tcaatacctg gttgggtcac agctcccatg cgagcccgaa   5220

ccggacgtag cagtgctcac ttccatgctc accgacccct cccacattac ggcggagacg   5280

gctaagcgta ggctggccag gggatctccc ccctccttgg ccagctcatc agctagccag   5340

ctgtctgcgc cttccttgaa ggcaacatgc actacccgtc atgactcccc ggacgctgac   5400

ctcatcgagg ccaacctcct gtggcggcag gagatgggcg ggaacatcac ccgcgtggag   5460

tcagaaaata aggtagtaat tttggactct ttcgagccgc tccaagcgga ggaggatgag   5520

agggaagtat ccgttccggc ggagatcctg cggaggtcca ggaaattccc tcgagcgatg   5580

cccatatggg cacgcccgga ttacaaccct ccactgttag agtcctggaa ggacccggac   5640

tacgtccctc cagtggtaca cgggtgtcca ttgccgcctg ccaaggcccc tccgatacca   5700

cctccacgga ggaagaggac ggttgtcctg tcagaatcta ccgtgtcttc tgccttggcg   5760

gagctcgcca caaagacctt cggcagctcc gaatcgtcgg ccgtcgacag cggcacggca   5820

acggcctctc ctgaccagcc ctccgacgac ggcgacgcgg gatccgacgt tgagtcgtac   5880

tcctccatgc ccccccttga gggggagccg ggggatcccg atctcagcga cgggtcttgg   5940

tctaccgtaa gcgaggaggc tagtgaggac gtcgtctgct gctcgatgtc ctacacatgg   6000

acaggcgccc tgatcacgcc atgcgctgcg gaggaaacca agctgcccat caatgcactg   6060

agcaactctt tgctccgtca ccacaacttg gtctatgcta caacatctcg cagcgcaagc   6120

ctgcggcaga agaaggtcac ctttgacaga ctgcaggtcc tggacgacca ctaccgggac   6180

gtgctcaagg agatgaaggc gaaggcgtcc acagttaagg ctaaacttct atccgtggag   6240

gaagcctgta agctgacgcc cccacattcg gccagatcta aatttggcta tggggcaaag   6300

gacgtccgga acctatccag caaggccgtt aaccacatcc gctccgtgtg gaaggacttg   6360

ctggaagaca ctgagacacc aattgacacc accatcatgg caaaaaatga ggttttctgc   6420

gtccaaccag agaagggggg ccgcaagcca gctcgcctta tcgtattccc agatttgggg   6480

gttcgtgtgt gcgagaaaat ggccctttac gatgtggtct ccaccctccc tcaggccgtg   6540

atgggctctt catacggatt ccaatactct cctggacagc gggtcgagtt cctggtgaat   6600

gcctggaaag cgaagaaatg ccctatgggc ttcgcatatg acacccgctg ttttgactca   6660
```

```
acggtcactg agaatgacat ccgtgttgag gagtcaatct accaatgttg tgacttggcc      6720

cccgaagcca gacaggccat aaggtcgctc acagagcggc tttacatcgg gggccccctg      6780

actaattcta aagggcagaa ctgcggctat cgccggtgcc gcgcgagcgg tgtactgacg      6840

accagctgcg gtaataccct cacatgttac ttgaaggccg ctgcggcctg tcgagctgcg      6900

aagctccagg actgcacgat gctcgtatgc ggagacgacc ttgtcgttat ctgtgaaagc      6960

gcggggaccc aagaggacga ggcgagccta cgggccttca cggaggctat gactagatac      7020

tctgcccccc ctggggaccc gcccaaacca gaatacgact tggagttgat aacatcatgc      7080

tcctccaatg tgtcagtcgc gcacgatgca tctggcaaaa gggtgtacta tctcacccgt      7140

gaccccacca cccccccttgc gcgggctgcg tgggagacag ctagacacac tccagtcaat      7200

tcctggctag gcaacatcat catgtatgcg cccaccttgt gggcaaggat gatcctgatg      7260

actcatttct tctccatcct tctagctcag gaacaacttg aaaaagccct agattgtcag      7320

atctacgggg cctgttactc cattgagcca cttgacctac ctcagatcat tcaacgactc      7380

catggcctta gcgcattttc actccatagt tactctccag gtgagatcaa tagggtggct      7440

tcatgcctca ggaaacttgg ggtaccgccc ttgcgagtct ggagacatcg ggccagaagt      7500

gtccgcgcta ggctactgtc ccaggggggg agggctgcca cttgtggcaa gtacctcttc      7560

aactgggcag taaggaccaa gctcaaactc actccaatcc cggctgcgtc ccagttggat      7620

ttatccagct ggttcgttgc tggttacagc gggggagaca tatatcacag cctgtctcgt      7680

gcccgacccc gctggttcat gtggtgccta ctcctacttt ctgtaggggt aggcatctat      7740

ctactcccca accgatgaac ggggagctaa acactccagg ccaataggcc atcctgtttt      7800

tttccctttt tttttttctt tttttttttt tttttttttt tttttttttt ttctcctttt      7860

tttttcctct tttttttcctt ttctttcctt tggtggctcc atcttagccc tagtcacggc      7920

tagctgtgaa aggtccgtga ccgcttgac tgcagagagt gctgatactg gcctctctgc      7980

agatcaagta ct                                                         7992
```

<210>   2
<211>   7992
<212>   DNA

<220>

<213> Artificial Sequence

<220>
<223> HCV2 subgenomic HCV replicon

<400> 2

```
gccagcccccc gattggggggc gacactccac catagatcac tcccctgtga ggaactactg      60

tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgtcgtgcag cctccaggac     120

ccccctccc gggagagcca tagtggtctg cggaaccggt gagtacaccg gaattgccag     180

gacgaccggg tcctttcttg gatcaacccg ctcaatgcct ggagatttgg gcgtgccccc     240

gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtact gcctgatagg     300

gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcacg aatcctaaac     360

ctcaaagaaa aaccaaaggg cgcgccatga ttgaacaaga tggattgcac gcaggttctc     420

cggccgcttg ggtggagagg ctattcggct atgactgggc acaacagaca atcggctgct     480

ctgatgccgc cgtgttccgg ctgtcagcgc agggggcgccc ggttcttttt gtcaagaccg     540

acctgtccgg tgccctgaat gaactgcagg acgaggcagc gcggctatcg tggctggcca     600

cgacgggcgt tccttgcgca gctgtgctcg acgttgtcac tgaagcggga agggactggc     660

tgctattggg cgaagtgccg gggcaggatc tcctgtcatc tcaccttgct cctgccgaga     720

aagtatccat catggctgat gcaatgcggc ggctgcatac gcttgatccg gctacctgcc     780

cattcgacca ccaagcgaaa catcgcatcg agcgagcacg tactcggatg gaagccggtc     840

ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcgccagcc gaactgttcg     900

ccaggctcaa ggcgcgcatg cccgacggcg aggatctcgt cgtgacccat ggcgatgcct     960

gcttgccgaa tatcatggtg gaaaatggcc gcttttctgg attcatcgac tgtggccggc    1020

tgggtgtggc ggaccgctat caggacatag cgttggctac ccgtgatatt gctgaagagc    1080

ttggcggcga atgggctgac cgcttcctcg tgctttacgg tatcgccgct cccgattcgc    1140

agcgcatcgc cttctatcgc cttcttgacg agttcttctg agtttaaaca gaccacaacg    1200

gtttccctct agcgggatca attccgcccc tctacctccc cccccctaa cgttactggc    1260

cgaagccgct tggaataagg ccggtgtgcg tttgtctata tgttattttc caccatattg    1320
```

```
ccgtcttttg gcaatgtgag ggcccggaaa cctggccctg tcttcttgac gagcattcct      1380

aggggtcttt cccctctcgc caaaggaatg caaggtctgt tgaatgtcgt gaaggaagca      1440

gttcctctgg aagcttcttg aagacaaaca acgtctgtag cgaccctttg caggcagcgg      1500

aacccccac ctggcgacag gtgcctctgc ggccaaaagc cacgtgtata agatacacct       1560

gcaaaggcgg cacaacccca gtgccacgtt gtgagttgga tagttgtgga aagagtcaaa      1620

tggctctcct caagcgtatt caacaagggg ctgaaggatg cccagaaggt accccattgt      1680

atgggatctg atctggggcc tcggtgcaca tgctttacat gtgtttagtc gaggttaaaa      1740

aacgtctagg cccccccgaac cacggggacg tggttttcct ttgaaaaaca cgataatacc     1800

atggcgccta ttacggccta ctcccaacag acgcgaggcc tacttggctg catcatcact     1860

agcctcacag gccgggacag gaaccaggtc gaggggagg tccaagtggt ctccaccgca      1920

acacaatctt tcctggcgac ctgcgtcaat ggcgtgtgtt ggactgtcta tcatggtgcc      1980

ggctcaaaga cccttgccgg cccaaagggc ccaatcaccc aaatgtacac caatgtggac      2040

caggacctcg tcggctggca agcgccccc ggggcgcgtt ccttgacacc atgcacctgc       2100

ggcagctcgg acctttactt ggtcacgagg catgccgatg tcattccggt gcgccggcgg      2160

ggcgacagca gggggagcct actctccccc aggcccgtct cctacttgaa gggctcttcg      2220

ggcggtccac tgctctgccc ctcggggcac gctgtgggca tctttcgggc tgccgtgtgc      2280

acccgagggg ttgcgaaggc ggtggacttt gtaccgtcg agtctatgga aaccactatg       2340

cggtccccgg tcttcacgga caactcgtcc cctccggccg taccgcagac attccaggtg      2400

gcccatctac acgcccctac tggtagcggc aagagcacta aggtgccggc tgcgtatgca      2460

gcccaagggt ataaggtgct tgtcctgaac ccgtccgtcg ccgccaccct aggtttcggg      2520

gcgtatgtgt ctaaggcaca tggtatcgac cctaacatca gaaccggggt aaggaccatc      2580

accacgggtg cccccatcac gtactccacc tatggcaagt ttcttgccga cggtggttgc      2640

tctgggggcg cctatgacat cataatatgt gatgagtgcc actcaactga ctcgaccact      2700

atcctgggca tcggcacagt cctggaccaa gcggagacgg ctggagcgcg actcgtcgtg      2760

ctcgccaccg ctacgcctcc gggatcggtc accgtgccac atccaaacat cgaggaggtg      2820
```

```
gctctgtcca gcactggaga aatccccttt tatggcaaag ccatccccat cgagaccatc      2880

aaggggggga ggcacctcat tttctgccat tccaagaaga aatgtgatga gctcgccgcg      2940

aagctgtccg gcctcggact caatgctgta gcatattacc ggggccttga tgtatccgtc      3000

ataccaacta gcggagacgt cattgtcgta gcaacggacg ctctaatgac gggctttacc      3060

ggcgatttcg actcagtgat cgactgcaat acatgtgtca cccagacagt cgacttcagc      3120

ctggacccga ccttcaccat tgagacgacg accgtgccac aagacgcggt gtcacgctcg      3180

cagcggcgag gcaggactgg taggggcagg atgggcattt acaggtttgt gactccagga      3240

gaacggccct cgggcatgtt cgattcctcg gttctgtgcg agtgctatga cgcgggctgt      3300

gcttggtacg agctcacgcc cgccgagacc tcagttaggt tgcgggctta cctaaacaca      3360

ccagggttgc ccgtctgcca ggaccatctg gagttctggg agagcgtctt tacaggcctc      3420

acccacatag acgcccattt cttgtcccag actaagcagg caggagacaa cttcccctac      3480

ctggtagcat accaggctac ggtgtgcgcc agggctcagg ctccacctcc atcgtgggac      3540

caaatgtgga agtgtctcat acggctaaag cctacgctgc acgggccaac gccctgctg       3600

tataggctgg gagccgttca aaacgaggtt actaccacac accccataac caaatacatc      3660

atggcatgca tgtcggctga cctggaggtc gtcacgagca cctgggtgct ggtaggcgga      3720

gtcctagcag ctctggccgc gtattgcctg acaacaggca gcgtggtcat tgtgggcagg      3780

atcatcttgt ccggaaagcc ggccatcatt cccgacaggg aagtccttta ccgggagttc      3840

gatgagatgg aagagtgcgc ctcacacctc ccttacatcg aacagggaat gcagctcgcc      3900

gaacaattca aacagaaggc aatcgggttg ctgcaaacag ccaccaagca agcggaggct      3960

gctgctcccg tggtggaatc caagtggcgg accctcgaag ccttctgggc gaagcatatg      4020

tggaatttca tcagcgggat acaatattta gcaggcttgt ccactctgcc tggcaacccc      4080

gcgatagcat cactgatggc attcacagcc tctatcacca gcccgctcac cacccaacat      4140

accctcctgt ttaacatcct ggggggatgg gtggccgccc aacttgctcc tcccagcgct      4200

gcttctgctt tcgtaggcgc cggcatcgct ggagcggctg ttggcagcat aggccttggg      4260

aaggtgcttg tggatatttt ggcaggttat ggagcagggg tggcaggcgc gctcgtggcc      4320
```

```
tttaaggtca tgagcggcga gatgccctcc accgaggacc tggttaacct actccctgct    4380

atcctctccc ctggcgccct agtcgtcggg gtcgtgtgcg cagcgatact gcgtcggcac    4440

gtgggcccag gggaggggc tgtgcagtgg atgaaccggc tgatagcgtt cgcttcgcgg    4500

ggtaaccacg tctcccccac gcactatgtg cctgagagcg acgctgcagc acgtgtcact    4560

cagatcctct ctagtcttac catcactcag ctgctgaaga ggcttcacca gtggatcaac    4620

gaggactgct ccacgccatg ctccggctcg tggctaagag atgtttggga ttggatatgc    4680

acggtgttga ctgatttcaa gacctggctc cagtccaagc tcctgccgcg attgccggga    4740

gtccccttct tctcatgtca acgtgggtac aagggagtct ggcggggcga cggcatcatg    4800

caaaccacct gcccatgtgg agcacagatc accggacatg tgaaaaacgg ttccatgagg    4860

atcgtggggc ctaggacctg tagtaacacg tggcatggaa cattccccat taacgcgtac    4920

accacgggcc cctgcacgcc ctccccggcg ccaaattatt ctaggcgct gtggcgggtg    4980

gctgctgagg agtacgtgga ggttacgcgg gtgggggatt ccactacgt gacgggcatg    5040

accactgaca acgtaaagtg cccgtgtcag gttccggccc ccgaattctt cacagaagtg    5100

gatggggtgc ggttgcacag gtacgctcca gcgtgcaaac ccctcctacg ggaggaggtc    5160

acattcctgg tcgggctcaa tcaatacctg gttgggtcac agctcccatg cgagcccgaa    5220

ccggacgtag cagtgctcac ttccatgctc accgacccct cccacattac ggcggagacg    5280

gctaagctta ggctggccag gggatctccc ccctccttgg ccagctcatc agctagccag    5340

ctgtctgcgc cttccttgaa ggcaacatgc actacccgtc atgactcccc ggacgctgac    5400

ctcatcgagg ccaacctcct gtggcggcag gagatgggcg ggaacatcac ccgcgtggag    5460

tcagaaaata aggtagtaat tttggactct ttcgagccgc tccaagcgga ggaggatgag    5520

agggaagtat ccgttccggc ggagatcctg cggaggtcca ggaaattccc tcgagcgatg    5580

cccatatggg cacgcccgga ttacaaccct ccactgttag agtcctggaa ggacccggac    5640

tacgtccctc cagtggtaca cgggtgtcca ttgccgcctg ccaaggcccc tccgatacca    5700

cctccacgga ggaagaggac ggttgtcctg tcagaatcta ccgtgtcttc tgccttggcg    5760

gagctcgcca caaagacctt cggcagctcc gaatcgtcgg ccgtcgacag cggcacggca    5820
```

```
acggcctctc ctgaccagcc ctccgacgac ggcgacgcgg gatccgacgt tgagtcgtac    5880

tcctccatgc cccccttga ggggagccg ggggatcccg atctcagcga cgggtcttgg     5940

tctaccgtaa gcgaggaggc tagtgaggac gtcgtctgct gctcgatgtc ctacacatgg    6000

acaggcgccc tgatcacgcc atgcgctgcg gaggaaacca agctgcccat caatgcactg    6060

agcaactctt tgctccgtca ccacaacttg gtctatgcta caacatctcg cagcgcaagc    6120

ctgcggcaga agaaggtcac ctttgacaga ctgcaggtcc tggacgacca ctaccgggac    6180

gtgctcaagg agatgaaggc gaaggcgtcc acagttaagg ctaaacttct atccgtggag    6240

gaagcctgta agctgacgcc cccacattcg gccagatcta aatttggcta tggggcaaag    6300

gacgtccgga acctatccag caaggccgtt aaccacatcc gctccgtgtg gaaggacttg    6360

ctggaagaca ctgagacacc aattgacacc accatcatgg caaaaaatga ggttttctgc    6420

gtccaaccag agaaggggg ccgcaagcca gctcgcctta tcgtattccc agatttgggg    6480

gttcgtgtgt gcgagaaaat ggccctttac gatgtggtct ccaccctccc tcaggccgtg    6540

atgggctctt catacggatt ccaatactct cctggacagc gggtcgagtt cctggtgaat    6600

gcctggaaag cgaagaaatg ccctatgggc ttcgcatatg acacccgctg ttttgactca    6660

acggtcactg agaatgacat ccgtgttgag gagtcaatct accaatgttg tgacttggcc    6720

cccgaagcca gacaggccat aaggtcgctc acagagcggc tttacatcgg gggccccctg    6780

actaattcta aagggcagaa ctgcggctat cgccggtgcc gcgcgagcgg tgtactgacg    6840

accagctgcg gtaataccct cacatgttac ttgaaggccg ctgcggcctg tcgagctgcg    6900

aagctccagg actgcacgat gctcgtatgc ggagacgacc ttgtcgttat ctgtgaaagc    6960

gcggggaccc aagaggacga ggcgagccta cgggccttca cggaggctat gactagatac    7020

tctgccccc ctggggaccc gcccaaacca gaatacgact tggagttgat aacatcatgc    7080

tcctccaatg tgtcagtcgc gcacgatgca tctggcaaaa gggtgtacta tctcacccgt    7140

gaccccacca ccccccttgc gcgggctgcg tgggagacag ctagacacac tccagtcaat    7200

tcctggctag gcaacatcat catgtatgcg cccaccttgt gggcaaggat gatcctgatg    7260

actcatttct tctccatcct tctagctcag gaacaacttg aaaaagccct agattgtcag    7320
```

atctacgggg cctgttactc cattgagcca cttgacctac ctcagatcat tcaacgactc   7380

catggcctta gcgcattttc actccatagt tactctccag gtgagatcaa tagggtggct   7440

tcatgcctca ggaaacttgg ggtaccgccc ttgcgagtct ggagacatcg ggccagaagt   7500

gtccgcgcta ggctactgtc ccagggggggg agggctgcca cttgtggcaa gtacctcttc   7560

aactgggcag taaggaccaa gctcaaactc actccaatcc cggctgcgtc ccagttggat   7620

ttatccagct ggttcgttgc tggttacagc gggggagaca tatatcacag cctgtctcgt   7680

gcccgacccc gctggttcat gtggtgccta ctcctacttt ctgtaggggt aggcatctat   7740

ctactcccca accgatgaac ggggagctaa acactccagg ccaataggcc atcctgtttt   7800

tttcccttt ttttttttctt tttttttttt ttttttttttt tttttttttt ttctcctttt   7860

tttttcctct tttttttccttt ttctttcctt tggtggctcc atcttagccc tagtcacggc   7920

tagctgtgaa aggtccgtga ccgcttgac tgcagagagt gctgatactg gcctctctgc   7980

agatcaagta ct   7992

<210>   3
<211>   7995
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   HCVR8 subgenomic HCV replicon

<400>   3
gccagccccc gattggggggc gacactccac catagatcac tcccctgtga ggaactactg   60

tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgtcgtgcag cctccaggac   120

cccccctccc gggagagcca tagtggtctg cggaaccggt gagtacaccg gaattgccag   180

gacgaccggg tcctttcttg gatcaacccg ctcaatgcct ggagatttgg gcgtgccccc   240

gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtact gcctgatagg   300

gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcacg aatcctaaac   360

ctcaaagaaa aaccaaaggg cgcgccatga ttgaacaaga tggattgcac gcaggttctc   420

cggccgcttg ggtggagagg ctattcggct atgactgggc acaacagaca atcggctgct   480

```
ctgatgccgc  cgtgttccgg  ctgtcagcgc  aggggcgccc  ggttcttttt  gtcaagaccg       540

acctgtccgg  tgccctgaat  gaactgcagg  acgaggcagc  gcggctatcg  tggctggcca       600

cgacgggcgt  tccttgcgca  gctgtgctcg  acgttgtcac  tgaagcggga  agggactggc       660

tgctattggg  cgaagtgccg  gggcaggatc  tcctgtcatc  tcaccttgct  cctgccgaga       720

aagtatccat  catggctgat  gcaatgcggc  ggctgcatac  gcttgatccg  gctacctgcc       780

cattcgacca  ccaagcgaaa  catcgcatcg  agcgagcacg  tactcggatg  gaagccggtc       840

ttgtcgatca  ggatgatctg  gacgaagagc  atcaggggct  cgcgccagcc  gaactgttcg       900

ccaggctcaa  ggcgcgcatg  cccgacggcg  aggatctcgt  cgtgacccat  ggcgatgcct       960

gcttgccgaa  tatcatggtg  gaaaatggcc  gcttttctgg  attcatcgac  tgtggccggc      1020

tgggtgtggc  ggaccgctat  caggacatag  cgttggctac  ccgtgatatt  gctgaagagc      1080

ttggcggcga  atgggctgac  cgcttcctcg  tgctttacgg  tatcgccgct  cccgattcgc      1140

agcgcatcgc  cttctatcgc  cttcttgacg  agttcttctg  agtttaaaca  gaccacaacg      1200

gtttccctct  agcgggatca  attccgcccc  tctccctccc  cccccctaa   cgttactggc      1260

cgaagccgct  tggaataagg  ccggtgtgcg  tttgtctata  tgttattttc  caccatattg      1320

ccgtcttttg  gcaatgtgag  ggcccggaaa  cctggccctg  tcttcttgac  gagcattcct      1380

aggggtcttt  cccctctcgc  caaaggaatg  caaggtctgt  tgaatgtcgt  gaaggaagca      1440

gttcctctgg  aagcttcttg  aagacaaaca  acgtctgtag  cgacccatttg caggcagcgg      1500

aacccccac   ctggcgacag  gtgcctctgc  ggccaaaagc  cacgtgtata  agatacacct      1560

gcaaaggcgg  cacaacccca  gtgccacgtt  gtgagttgga  tagttgtgga  aagagtcaaa      1620

tggctctcct  caagcgtatt  caacaagggg  ctgaaggatg  cccagaaggt  accccattgt      1680

atgggatctg  atctggggcc  tcggtgcaca  tgctttacat  gtgtttagtc  gaggttaaaa      1740

aacgtctagg  ccccccgaac  cacggggacg  tggttttcct  ttgaaaaaca  cgataatacc      1800

atggcgccta  ttacggccta  ctcccaacag  acgcgaggcc  tacttggctg  catcatcact      1860

agcctcacag  gccgggacag  gaaccaggtc  gaggggagg   tccaagtggt  ctccaccgca      1920

acacaatctt  tcctggcgac  ctgcgtcaat  ggcgtgtgtt  ggactgtcta  tcatggtgcc      1980
```

```
ggctcaaaga cccttgccgg cccaaagggc ccaatcaccc aaatgtacac caatgtggac   2040

caggacctcg tcggctggca agcgcccccc ggggcgcgtt ccttgacacc atgcacctgc   2100

ggcagctcgg acctttactt ggtcacgagg catgccgatg tcattccggt gcgccggcgg   2160

ggcgacagca gggggagcct actctccccc aggcccgtct cctacttgaa gggctcttcg   2220

ggcggtccac tgctctgccc ctcggggcac gctgtgggca tctttcgggc tgccgtgtgc   2280

acccgagggg ttgcgaaggc ggtggacttt gtaccgtcg agtctatggg aaccactatg    2340

cggtccccgg tcttcacgga caactcgtcc cctccggccg taccgcagac attccaggtg   2400

gcccatctac acgcccctac tggtagcggc aagagcacta aggtgccggc tgcgtatgca   2460

gcccaagggt ataaggtgct tgtcctgaac ccgtccgtcg ccgccaccct aggtttcggg   2520

gcgtatatgt ctaaggcaca tggtatcgac cctaacatca gaaccggggt aaggaccatc   2580

accacgggtg cccccatcac gtactccacc tatggcaagt ttcttgccga cggtggttgc   2640

tctgggggcg cctatgacat cataatatgt gatgagtgcc actcaactga ctcgaccact   2700

atcctgggca tcggcacagt cctggaccaa gcggagacgg ctggagcgcg actcgtcgtg   2760

ctcgccaccg ctacgcctcc gggatcggtc accgtgccac atccaaacat cgaggaggtg   2820

gctctgtcca gcactggaga aatccccttt tatggcaaag ccatccccat cgagaccatc   2880

aagggggga ggcacctcat tttctgccat tccaagaaga aatgtgatga gctcgccgcg    2940

aagctgtccg gcctcggact caatgctgta gcatattacc ggggccttga tgtatccgtc   3000

ataccaacta gcggagacgt cattgtcgta gcaacggacg ctctaatgac gggctttacc   3060

ggcgatttcg actcagtgat cgactgcaat acatgtgtca cccagacagt cgacttcagc   3120

ctggacccga ccttcaccat tgagacgacg accgtgccac aagacgcggt gtcacgctcg   3180

cagcggcgag gcaggactgg tagggcagg atgggcattt acaggtttgt gactccagga    3240

gaacggccct cgggcatgtt cgattcctcg gttctgtgcg agtgctatga cgcgggctgt   3300

gcttggtacg agctcacgcc cgccgagacc tcagttaggt tgcgggctta cctaaacaca   3360

ccagggttgc ccgtctgcca ggaccatctg gagttctggg agagcgtctt tacaggcctc   3420

acccacatag acgcccattt cttgtcccag actaagcagg caggagacaa cttcccctac   3480
```

```
ctggtagcat accaggctac ggtgtgcgcc agggctcagg ctccacctcc atcgtgggac    3540

caaatgtgga agtgtctcat acggctaaag cctacgctgc acgggccaac gcccctgctg    3600

tataggctgg gagccgttca aaacgaggtt actaccacac accccataac caaatacatc    3660

atggcatgca tgtcggctga cctggaggtc gtcacgagca cctgggtgct ggtaggcgga    3720

gtcctagcag ctctggccgc gtattgcctg acaacaggca gcgtggtcat tgtgggcagg    3780

atcatcttgt ccggaaagcc ggccatcatt cccgacaggg aagtccttta ccgggagttc    3840

gatgagatgg aagagtgcgc ctcacacctc ccttacatcg aacagggaat gcagctcgcc    3900

gaacaattca aacagaaggc aatcgggttg ctgcaaacag ccaccaagca agcggaggct    3960

gctgctcccg tggtggaatc caagtggcgg accctcgaag ccttctgggc gaagcatatg    4020

tggaatttca tcagcgggat acaatattta gcaggcttgt ccactctgcc tggcaacccc    4080

gcgatagcat cactgatggc attcacagcc tctatcacca gcccgctcac cacccaacat    4140

accctcctgt ttaacatcct ggggggatgg gtggccgccc aacttgctcc tcccagcgct    4200

gcttctgctt tcgtaggcgc cggcatcgct ggagcggctg ttggcagcat aggccttggg    4260

aaggtgcttg tggatatttt ggcaggttat ggagcagggg tggcaggcgc gctcgtggcc    4320

tttaaggtca tgagcggcga gatgccctcc accgaggacc tggttaacct actccctgct    4380

atcctctccc ctggcgccct agtcgtcggg gtcgtgtgcg cagcgatact gcgtcggcac    4440

gtgggcccag gggagggggc tgtgcagtgg atgaaccggc tgatagcgtt cgcttcgcgg    4500

ggtaaccacg tctcccccac gcactatgtg cctgagagcg acgctgcagc acgtgtcact    4560

cagatcctct ctagtcttac catcactcag ctgctgaaga ggcttcacca gtggatcaac    4620

gaggactgct ccacgccatg ctccggctcg tggctaagag atgtttggga ttggatatgc    4680

acggtgttga ctgatttcaa gacctggctc cagtccaagc tcctgccgcg attgccggga    4740

gtccccttct tctcatgtca acgtgggtac aagggagtct ggcggggcga cggcatcatg    4800

caaaccacct gcccatgtgg agcacagatc accggacatg tgaaaaaaaa cggttccatg    4860

aggatcgtgg ggcctaggac ctgtagtaac acgtggcatg gaacattccc cattaacgcg    4920

tacaccacgg gcccctgcac gccctccccg gcgccaaatt attctagggc gctgtggcgg    4980
```

```
gtggctgctg aggagtacgt ggaggttacg cgggtggggg atttccacta cgtgacgggc      5040

atgaccactg acaacgtaaa gtgcccgtgt caggttccgg cccccgaatt cttcacagaa      5100

gtggatgggg tgcggttgca caggtacgct ccagcgtgca aacccctcct acgggaggag      5160

gtcacattcc tggtcgggct caatcaatac ctggttgggt cacagctccc atgcgagccc      5220

gaaccggacg tagcagtgct cacttccatg ctcaccgacc cctcccacat tacggcggag      5280

acggctaagc gtaggctggc caggggatct cccccctcct tggccagctc atcagctagc      5340

cagctgtctg cgccttcctt gaaggcaata tgcactaccc gtcatgactc cccggacgct      5400

gacctcatcg aggccaacct cctgtggcgg caggagatgg gcgggaacat cacccgcgtg      5460

gagtcagaaa ataaggtagt aattttggac tctttcgagc cgctccaagc ggaggaggat      5520

gagagggaag tatccgttcc ggcggagatc ctgcggaggt ccaggaaatt ccctcgagcg      5580

atgcccatat gggcacgccc ggattacaac cctccactgt tagagtcctg gaaggacccg      5640

gactacgtcc ctccagtggt acacgggtgt ccattccgc ctgccaaggc ccctccgata      5700

ccacctccac ggaggaagag gacggttgtc ctgtcagaat ctaccgtgtc ttctgccttg      5760

gcggagctcg ccacaaagac cttcggcagc tccgaatcgt cggccgtcga cagcggcacg      5820

gcaacggcct ctcctgacca gccctccgac gacggcgacg cgggatccga cgttgagtcg      5880

tactcctcca tgcccccct tgaggggag ccggggatc ccgatctcag cgacgggtct      5940

tggtctaccg taagcgagga ggctagtgag gacgtcgtct gctgctcgat gtcctacaca      6000

tggacaggcg ccctgatcac gccatgcgct gcggaggaaa ccaagctgcc catcaatgca      6060

ctgagcaact ctttgctccg tcaccacaac ttggtctatg ctacaacatc tcgcagcgca      6120

agcctgcggc agaagaaggt cacctttgac agactgcagg tcctggacga ccactaccgg      6180

gacgtgctca aggagatgaa ggcgaaggcg tccacagtta aggctaaact tctatccgtg      6240

gaggaagcct gtaagctgac gcccccacat tcggccagat ctaaatttgg ctatggggca      6300

aaggacgtcc ggaacctatc cagcaaggcc gttaaccaca tccgctccgt gtggaaggac      6360

ttgctggaag acactgagac accaattgac accaccatca tggcaaaaaa tgaggttttc      6420

tgcgtccaac cagagaaggg gggccgcaag ccagctcgcc ttatcgtatt cccagatttg      6480
```

```
ggggttcgtg tgtgcgagaa aatggccctt tacgatgtgg tctccaccct ccctcaggcc    6540

gtgatgggct cttcatacgg attccaatac tctcctggac agcgggtcga gttcctggtg    6600

aatgcctgga aagcgaagaa atgccctatg ggcttcgcat atgacacccg ctgttttgac    6660

tcaacggtca ctgagaatga catccgtgtt gaggagtcaa tctaccaatg ttgtgacttg    6720

gcccccgaag ccagacaggc cataaggtcg ctcacagagc ggctttacat cggggggcccc   6780

ctgactaatt ctaaagggca gaactgcggc tatcgccggt ccgcgcgag cggtgtactg      6840

acgaccagct gcggtaatac cctcacatgt tacttgaagg ccgctgcggc ctgtcgagct    6900

gcgaagctcc aggactgcac gatgctcgta tgcggagacg accttgtcgt tatctgtgaa    6960

agcgcgggga cccaagagga cgaggcgagc ctacgggcct tcacggaggc tatgactaga    7020

tactctgccc ccctggggga cccgcccaaa ccagaatacg acttggagtt gataacatca    7080

tgctcctcca atgtgtcagt cgcgcacgat gcatctggca aaagggtgta ctatctcacc    7140

cgtgaccca ccaccccct tgcgcgggct gcgtgggaga cagctagaca cactccagtc      7200

aattcctggc taggcaacat catcatgtat gcgcccacct tgtgggcaag gatgatcctg    7260

atgactcatt tcttctccat ccttctagct caggaacaac ttgaaaaagc cctagattgt    7320

cagatctacg gggcctgtta ctccattgag ccacttgacc tacctcagat cattcaacga    7380

ctccatggcc ttagcgcatt ttcactccat agttactctc caggtgagat caatagggtg    7440

gcttcatgcc tcaggaaact tggggtaccg cccttgcgag tctggagaca tcgggccaga    7500

agtgtccgcg ctaggctact gtcccagggg gggagggctg ccacttgtgg caagtacctc    7560

ttcaactggg cagtaaggac caagctcaaa ctcactccaa tcccggctgc gtcccagttg    7620

gatttatcca gctggttcgt tgctggttac agcggggggag acatatatca cagcctgtct   7680

cgtgcccgac cccgctggtt catgtggtgc ctactcctac tttctgtagg ggtaggcatc    7740

tatctactcc ccaaccgatg aacggggagc taaacactcc aggccaatag gccatcctgt    7800

ttttttccct tttttttttt cttttttttt tttttttttt tttttttttt tttttctcct    7860

tttttttcc tctttttttc ctttctttc ctttggtggc tccatcttag ccctagtcac      7920

ggctagctgt gaaaggtccg tgagccgctt gactgcagag agtgctgata ctggcctctc     7980
```

tgcagatcaa gtact   7995

<210>   4
<211>   7992
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   HCVR9 subgenomic HCV replicon

<400>   4
gccagccccc gattgggggc gacactccac catagatcac tcccctgtga ggaactactg   60

tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgtcgtgcag cctccaggac   120

ccccctccc gggagagcca tagtggtctg cggaaccggt gagtacaccg gaattgccag   180

gacgaccggg tcctttcttg gatcaacccg ctcaatgcct ggagatttgg gcgtgccccc   240

gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtact gcctgatagg   300

gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcacg aatcctaaac   360

ctcaaagaaa aaccaaaggg cgcgccatga ttgaacaaga tggattgcac gcaggttctc   420

cggccgcttg ggtggagagg ctattcggct atgactgggc acaacagaca atcggctgct   480

ctgatgccgc cgtgttccgg ctgtcagcgc aggggcgccc ggttcttttt gtcaagaccg   540

acctgtccgg tgccctgaat gaactgcagg acgaggcagc gcggctatcg tggctggcca   600

cgacgggcgt tccttgcgca gctgtgctcg acgttgtcac tgaagcggga agggactggc   660

tgctattggg cgaagtgccg gggcaggatc tcctgtcatc tcaccttgct cctgccgaga   720

aagtatccat catggctgat gcaatgcggc ggctgcatac gcttgatccg gctacctgcc   780

cattcgacca ccaagcgaaa catcgcatcg agcgagcacg tactcggatg gaagccggtc   840

ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcgccagcc gaactgttcg   900

ccaggctcaa ggcgcgcatg cccgacggcg aggatctcgt cgtgacccat ggcgatgcct   960

gcttgccgaa tatcatggtg gaaaatggcc gcttttctgg attcatcgac tgtggccggc   1020

tgggtgtggc ggaccgctat caggacatag cgttggctac ccgtgatatt gctgaagagc   1080

ttggcggcga atgggctgac cgcttcctcg tgctttacgg tatcgccgct cccgattcgc   1140

```
agcgcatcgc cttctatcgc cttcttgacg agttcttctg agtttaaaca gaccacaacg    1200

gtttccctct agcgggatca attccgcccc tctccctccc ccccccctaa cgttactggc    1260

cgaagccgct tggaataagg ccggtgtgcg tttgtctata tgttattttc caccatattg    1320

ccgtcttttg gcaatgtgag ggcccggaaa cctggccctg tcttcttgac gagcattcct    1380

aggggtcttt cccctctcgc caaaggaatg caaggtctgt tgaatgtcgt gaaggaagca    1440

gttcctctgg aagcttcttg aagacaaaca acgtctgtag cgaccctttg caggcagcgg    1500

aaccccccac ctggcgacag gtgcctctgc ggccaaaagc cacgtgtata agatacacct    1560

gcaaaggcgg cacaacccca gtgccacgtt gtgagttgga tagttgtgga aagagtcaaa    1620

tggctctcct caagcgtatt caacaagggg ctgaaggatg cccagaaggt accccattgt    1680

atgggatctg atctggggcc tcggtgcaca tgctttacat gtgtttagtc gaggttaaaa    1740

aacgtctagg cccccgaac cacggggacg tggttttcct ttgaaaaaca cgataatacc    1800

atggcgccta ttacggccta ctcccaacag acgcgaggcc tacttggctg catcatcact    1860

agcctcacag gccgggacag gaaccaggtc gagggggagg tccaggtggt ctccaccgca    1920

acacaatctt tcctggcgac ctgcgtcaat ggcgtgtgtt ggactgtcta tcatggtgcc    1980

ggctcaaaga cccttgccgg cccaaagggc ccaatcaccc aaatgtacac caatgtggac    2040

caggacctcg tcggctggca agcgcccccc ggggcgcgtt ccttgacacc atgcacctgc    2100

ggcagctcgg acctttactt ggtcacgagg catgccgatg tcattccggt gcgccggcgg    2160

ggcgacagca gggggagcct actctccccc aggcccgtct cctacttgaa gggctcttcg    2220

ggcggtccac tgctctgccc ctcggggcac gctgtgggca tctttcgggc tgccgtgtgc    2280

acccgagggg ttgcgaaggc ggtggacttt gtaccgtcg agtctatgga aaccactatg    2340

cggtccccgg tcttcacgga caactcgtcc cctccggccg taccgcagac attccaggtg    2400

gcccatctac acgcccctac tggtagcggc aagagcacta aggtgccggc tgcgtatgca    2460

gcccaagggt ataaggtgct tgtcctgaac ccgtccgtcg ccgccaccct aggtttcggg    2520

gcgtatatgt ctaaggcaca tggtatcgac cctaacatca gaaccggggt aaggaccatc    2580

accacgggtg cccccatcac gtactccacc tatggcaagt ttcttgccga cggtggttgc    2640
```

```
tctgggggcg cctatgacat cataatatgt gatgagtgcc actcaactga ctcgaccact    2700

atcctgggca tcggcacagt cctggaccaa gcggagacgg ctggagcgcg actcgtcgtg    2760

ctcgccaccg ctacgcctcc gggatcggtc accgtgccac atccaaacat cgaggaggtg    2820

gctctgtcca gcactggaga aatccccttt tatggcaaag ccatccccat cgagaccatc    2880

aagggggga ggcacctcat tttctgccat tccaagaaga aatgtgatga gctcgccgcg     2940

aagctgtccg gcctcggact caatgctgta gcatattacc ggggccttga tgtatccgtc    3000

ataccaacta gcggagacgt cattgtcgta gcaacggacg ctctaatgac gggctttacc    3060

ggcgatttcg actcagtgat cgactgcaat acatgtgtca cccagacagt cgacttcagc    3120

ctggacccga ccttcaccat tgagacgacg accgtgccac aagacgcggt gtcacgctcg    3180

cagcggcgag gcaggactgg taggggcagg atgggcattt acaggtttgt gactccagga    3240

gaacggccct cgggcatgtt cgattcctcg gttctgtgcg agtgctatga cgcgggctgt    3300

gcttggtacg agctcacgcc cgccgagacc tcagttaggt tgcgggctta cctaaacaca    3360

ccagggttgc ccgtctgcca ggaccatctg gagttctggg agagcgtctt tacaggcctc    3420

acccacatag acgcccattt cttgtcccag actaagcagg caggagacaa cttcccctac    3480

ctggtagcat accaggctac ggtgtgcgcc agggctcagg ctccacctcc atcgtgggac    3540

caaatgtgga agtgtctcat acggctaaag cctacgctgc acgggccaac gcccctgctg    3600

tataggctgg gagccgttca aaacgaggtt actaccacac accccataac caaatacatc    3660

atggcatgca tgtcggctga cctggaggtc gtcacgagca cctgggtgct ggtaggcgga    3720

gtcctagcag ctctggccgc gtattgcctg acaacaggca gcgtggtcat tgtgggcagg    3780

atcatcttgt ccggaaggcc ggccatcatt cccgacaggg aagtccttta ccgggagttc    3840

gatgagatgg aagagtgcgc ctcacacctc ccttacatcg aacagggaat gcagctcgcc    3900

gaacaattca aacagaaggc aatcgggttg ctgcaaacag ccaccaagca agcggaggct    3960

gctgctcccg tggtggaatc caagtggcgg accctcgaag ccttctgggc gaagcatatg    4020

tggaatttca tcagcgggat acaatattta gcaggcttgt ccactctgcc tggcaacccc    4080

gcgatagcat cactgatggc attcacagcc tctatcacca gcccgctcac cacccaacat    4140
```

```
accctcctgt ttaacatcct gggggatgg gtggccgccc aacttgctcc tcccagcgct   4200

gcttctgctt tcgtaggcgc cggcatcgct ggagcggctg ttggcagcat aggccttggg   4260

aaggtgcttg tggatatttt ggcaggttat ggagcagggg tggcaggcgc gctcgtggcc   4320

tttaaggtca tgagcggcga gatgccctcc accgaggacc tggctaacct actccctgct   4380

atcctctccc ctggcgccct agtcgtcggg gtcgtgtgcg cagcgatact gcgtcggcac   4440

gtgggcccag gggaggggc tgtgcagtgg atgaaccggc tgatagcgtt cgcttcgcgg   4500

ggtaaccacg tctcccccac gcactatgtg cctgagagcg acgctgcagc acgtgtcact   4560

cagatcctct ctagtcttac catcactcag ctgctgaaga ggcttcacca gtggatcaac   4620

gaggactgct ccacgccatg ctccggctcg tggctaagag atgtttggga ttggatatgc   4680

acggtgttga ctgatttcaa gacctggctc cagtccaagc tcctgccgcg attgccggga   4740

gtccccttct tctcatgtca acgtgggtac aagggagtct ggcggggcga cggcatcatg   4800

caaaccacct gcccatgtgg agcacagatc accggacatg tgaaaaaagg ttccatgagg   4860

atcgtggggc ctaggacctg tagtaacacg tggcatggaa cattccccat taacgcgtac   4920

accacgggcc cctgcacgcc ctccccggcg ccaaattatt ctagggcgct gtggcgggtg   4980

gctgctgagg agtacgtgga ggttacgcgg gtggggatt tccactacgt gacgggcatg   5040

accactgaca acgtaaagtg cccgtgtcag gttccggccc ccgaattctt cacagaagtg   5100

gatggggtgc ggttgcacag gtacgctcca gcgtgcaaac ccctcctacg ggaggaggtc   5160

acattcctgg tcgggctcaa tcaatacctg gttgggtcac agctcccatg cgagcccgaa   5220

ccggacgtag cagtgctcac ttccatgctc accgacccct cccacattac ggcggagacg   5280

gctaagcgta ggctggccag gggatctccc ccctccttgg ccagctcatc agctagccag   5340

ctgtctgcgc cttccttgaa ggcaacatgc actacccgtc atgactcccc ggacgctgac   5400

ctcatcgagg ccaacctcct gtggcggcag gagatgggcg gaacatcac ccgcgtggag   5460

tcagaaaata aggtagtaat tttggactct ttcgagccgc tccaagcgga ggaggatgag   5520

agggaagtat ccgttccggc ggagatcctg cggaggtcca ggaaattccc tcgagcgatg   5580

cccatatggg cacgcccgga ttacaaccct ccactgttag agtcctggaa ggacccggac   5640
```

```
tacgtccctc cagtggtaca cgggtgtcca ttgccgcctg ccaaggcccc tccgatacca    5700

cctccacgga ggaagaggac ggttgtcctg tcagaatcta ccgtgtcttc tgccttggcg    5760

gagctcgcca caaagacctt cggcagctcc gaatcgtcgg ccgtcgacag cggcacggca    5820

acggcctctc ctgaccagcc ctccgacgac ggcgacgcgg gatccgacgt tgagtcgtac    5880

tcctccatgc cccccttga gggggagccg ggggatcccg atctcagcga cgggtcttgg    5940

tctaccgtaa gcgaggaggc tagtgaggac gtcgtctgct gctcgatgtc ctacacatgg    6000

acaggcgccc tgatcacgcc atgcgctgcg gaggaaacca agctgcccat caatgcactg    6060

agcaactctt tgctccgtca ccacaacttg gtctatgcta caacatctcg cagcgcaagc    6120

ctgcggcaga agaaggtcac ctttgacaga ctgcaggtcc tggacgacca ctaccgggac    6180

gtgctcaagg agatgaaggc gaaggcgtcc acagttaagg ctaaacttct atccgtggag    6240

gaagcctgta agctgacgcc cccacattcg gccagatcta aatttggcta tggggcaaag    6300

gacgtccgga acctatccag caaggccgtt aaccacatcc gctccgtgtg gaaggacttg    6360

ctggaagaca ctgagacacc aattgacacc accatcatgg caaaaaatga ggttttctgc    6420

gtccaaccag agaagggggg ccgcaagcca gctcgcctta tcgtattccc agatttgggg    6480

gttcgtgtgt gcgagaaaat ggccctttac gatgtggtct ccaccctccc tcaggccgtg    6540

atgggctctt catacggatt ccaatactct cctggacagc gggtcgagtt cctggtgaat    6600

gcctggaaag cgaagaaatg ccctatgggc ttcgcatatg acacccgctg ttttgactca    6660

acggtcactg agaatgacat ccgtgttgag gagtcaatct accaatgttg tgacttggcc    6720

cccgaagcca gacaggccat aaggtcgctc acagagcggc tttacatcgg gggccccctg    6780

actaattcta aagggcagaa ctgcggctat cgccggtgcc gcgcgagcgg tgtactgacg    6840

accagctgcg gtaataccct cacatgttac ttgaaggccg ctgcggcctg tcgagctgcg    6900

aagctccagg actgcacgat gctcgtatgc ggagacgacc ttgtcgttat ctgtgaaagc    6960

gcggggaccc aagaggacga ggcgagccta cgggccttca cggaggctat gactagatac    7020

tctgcccccc ctggggaccc gcccaaacca gaatacgact tggagttgat aacatcatgc    7080

tcctccaatg tgtcagtcgc gcacgatgca tctggcaaaa gggtgtacta tctcacccgt    7140
```

```
gaccccacca cccccctttgc gcgggctgcg tgggagacag ctagacacac tccagtcaat   7200

tcctggctag gcaacatcat catgtatgcg cccaccttgt gggcaaggat gatcctgatg   7260

actcatttct tctccatcct tctagctcag gaacaacttg aaaaagccct agattgtcag   7320

atctacgggg cctgttactc cattgagcca cttgacctac ctcagatcat tcaacgactc   7380

catggcctta gcgcattttc actccatagt tactctccag gtgagatcaa tagggtggct   7440

tcatgcctca ggaaacttgg ggtaccgccc ttgcgagtct ggagacatcg ggccagaagt   7500

gtccgcgcta ggctactgtc cagggggggg agggctgcca cttgtggcaa gtacctcttc   7560

aactgggcag taaggaccaa gctcaaactc actccaatcc cggctgcgtc ccagttggat   7620

ttatccagct ggttcgttgc tggttacagc gggggagaca tatatcacag cctgtctcgt   7680

gcccgacccc gctggttcat gtggtgccta ctcctacttt ctgtaggggt aggcatctat   7740

ctactcccca accgatgaac ggggagctaa acactccagg ccaataggcc atcctgtttt   7800

tttcccttt ttttttttctt tttttttttt ttttttttt ttttttttt ttctccttt   7860

tttttcctct tttttttccctt ttctttcctt tggtggctcc atcttagccc tagtcacggc   7920

tagctgtgaa aggtccgtga ccgcttgac tgcagagagt gctgatactg gcctctctgc   7980

agatcaagta ct                                                       7992


<210>   5
<211>   7992
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   HCVR22 subgenomic HCV replicon

<400>   5
gccagccccc gattggggggc gacactccac catagatcac tcccctgtga ggaactactg    60

tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgtcgtgcag cctccaggac    120

cccccctccc gggagagcca tagtggtctg cggaaccggt gagtacaccg gaattgccag    180

gacgaccggg tcctttcttg gatcaacccg ctcaatgcct ggagatttgg gcgtgccccc    240

gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtact gcctgatagg    300
```

```
gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcacg aatcctaaac      360

ctcaaagaaa aaccaaaggg cgcgccatga ttgaacaaga tggattgcac gcaggttctc      420

cggccgcttg ggtggagagg ctattcggct atgactgggc acaacagaca atcggctgct      480

ctgatgccgc cgtgttccgg ctgtcagcgc aggggcgccc ggttcttttt gtcaagaccg      540

acctgtccgg tgccctgaat gaactgcagg acgaggcagc gcggctatcg tggctggcca      600

cgacgggcgt tccttgcgca gctgtgctcg acgttgtcac tgaagcggga agggactggc      660

tgctattggg cgaagtgccg gggcaggatc tcctgtcatc tcaccttgct cctgccgaga      720

aagtatccat catggctgat gcaatgcggc ggctgcatac gcttgatccg gctacctgcc      780

cattcgacca ccaagcgaaa catcgcatcg agcgagcacg tactcggatg gaagccggtc      840

ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcgccagcc gaactgttcg      900

ccaggctcaa ggcgcgcatg cccgacggcg aggatctcgt cgtgacccat ggcgatgcct      960

gcttgccgaa tatcatggtg gaaaatggcc gcttttctgg attcatcgac tgtggccggc     1020

tgggtgtggc ggaccgctat caggacatag cgttggctac ccgtgatatt gctgaagagc     1080

ttggcggcga atgggctgac cgcttcctcg tgctttacgg tatcgccgct cccgattcgc     1140

agcgcatcgc cttctatcgc cttcttgacg agttcttctg agtttaaaca gaccacaacg     1200

gtttccctct agcgggatca attccgcccc tctccctccc cccccctaa cgttactggc     1260

cgaagccgct tggaataagg ccggtgtgcg tttgtctata tgttattttc caccatattg     1320

ccgtcttttg gcaatgtgag ggcccggaaa cctggccctg tcttcttgac gagcattcct     1380

aggggtcttt cccctctcgc caaaggaatg caaggtctgt tgaatgtcgt gaaggaagca     1440

gttcctctgg aagcttcttg aagacaaaca acgtctgtag cgacccttttg caggcagcgg     1500

aacccccac ctggcgacag gtgcctctgc ggccaaaagc cacgtgtata agatacacct     1560

gcaaaggcgg cacaaccсca gtgccacgtt gtgagttgga tagttgtgga aagagtcaaa     1620

tggctctcct caagcgtatt caacaagggg ctgaaggatg cccagaaggt accccattgt     1680

atgggatctg atctggggcc tcggtgcaca tgctttacat gtgtttagtc gaggttaaaa     1740

aacgtctagg cccccccgaat cacggggacg tggtttttcct ttgaaaaaca cgataatacc     1800
```

```
atggcgccta ttacggccta ctcccaacag acgcgaggcc tacttggctg catcatcact    1860

agcctcacag gccgggacag gaaccaggtc gaggggggagg tccaagtggt ctccaccgca   1920

acacaatctt tcctggcgac ctgcgtcaat ggcgtgtgtt ggactgtcta tcatggtgcc    1980

ggctcaaaga cccttgccgg cccaaagggc ccaatcaccc aaatgtacac caatgtggac    2040

caggacctcg tcggctggca agcgccccccc ggggcgcgtt ccttgacacc atgcacctgc   2100

ggcagctcgg acctttactt ggtcacgagg catgccgatg tcattccggt cgccggcggg    2160

ggcgacagca gggggagcct actctcccccc aggcccgtct cctacttgaa gggctcttcg   2220

ggcggtccac tgctctgccc ctcgggggcac gctgtgggca tctttcgggc tgccgtgtgc    2280

acccgagggg ttgcgaaggc ggtggacttt gtacccgtcg agtctatggg aaccactatg    2340

cggtccccgg tcttcacgga caactcgtcc cctccggccg taccgcagac attccaggtg    2400

gcccatctac acgcccctac tggtagcggc aagagcacta aggtgccggc tgcgtatgca    2460

gcccaagggt ataaggtgct tgtcctgaac ccgtccgtcg ccgccaccct aggtttcggg    2520

gcgtatatgt ctaaggcaca tggtatcgac cctaacatca gaaccggggt aaggaccatc    2580

accacgggtg cccccatcac gtactccacc tatggcaagt ttcttgccga cggtggttgc    2640

tctggggggcg cctatgacat cataatatgt gatgagtgcc actcaactga ctcgaccact    2700

atcctgggca tcggcacagt cctggaccaa gcggagacgg ctggagcgcg actcgtcgtg    2760

ctcgccaccg ctacgcctcc gggatcggtc accgtgccac atccaaacat cgaggaggtg    2820

gctctgtcca gcactggaga atccccttt tatggcaaag ccatccccat cgagaccatc    2880

aaggggggga ggcacctcat tttctgccat tccaagaaga aatgtgatga gctcgccgcg    2940

aagctgtccg gcctcggact caatgctgta gcatattacc ggggccttga tgtatccgtc    3000

ataccaacta gcggagacgt cattgtcgta gcaacggacg ctctaatgac gggctttacc    3060

ggcgatttcg actcagtgat cgactgcaat acatgtgtca cccagacagt cgacttcagc    3120

ctggacccga ccttcaccat tgagacgacg accgtgccac aagacgcggt gtcacgctcg    3180

cagcggcgag gcaggactgg taggggcagg atgggcattt acaggtttgt gactccagga    3240

gaacggcccct cgggcatgtt cgattcctcg gttctgtgcg agtgctatga cgcgggctgt    3300
```

```
gcttggtacg agctcacgcc cgccgagacc tcagttaggt tgcgggctta cctaaacaca    3360

ccagggttgc ccgtctgcca ggaccatctg gagttctggg agagcgtctt tacaggcctc    3420

acccacatag acgcccattt cttgtcccag actaagcagg caggagacaa cttcccctac    3480

ctggtagcat accaggctac ggtgtgcgcc agggctcagg ctccacctcc atcgtgggac    3540

caaatgtgga agtgtctcat acggctaaag cctacgctgc acgggccaac gcccctgctg    3600

tataggctgg gagccgttca aaacgaggtt actaccacac accccataac caaatacatc    3660

atggcatgca tgtcggctga cctggaggtc gtcacgagca cctgggtgct ggtaggcgga    3720

gtcctagcag ctctggccgc gtattgcctg acaacaggca gcgtggtcat tgtgggcagg    3780

atcatcttgt ccggaaagcc ggccatcatt cccgacaggg aagtccttta ccgggagttc    3840

gatgagatgg aagagtgcgc ctcacacctc ccttacatcg aacagggaat gcagctcgcc    3900

gaacaattca aacagaaggc aatcgggttg ctgcgaacag ccaccaagca agcggaggct    3960

gctgctcccg tggtggaatc caagtggcgg accctcgaag ccttctgggc gaagcatatg    4020

tggaatttca tcagcgggat acaatattta gcaggcttgt ccactctgcc tggcaacccc    4080

gcgatagcat cactgatggc attcacagcc tctatcacca gcccgctcac cacccaacat    4140

accctcctgt ttaacatcct ggggggatgg gtggccgccc aacttgctcc tcccagcgct    4200

gcttctgctt tcgtaggcgc cggcatcgct ggagcggctg ttggcagcat aggccttggg    4260

aaggtgcttg tggatatttt ggcaggttat ggagcagggg tggcaggcgc gctcgtggcc    4320

tttaaggtca tgagcggcga gatgccctcc accgaggacc tggttaacct actccctgct    4380

atcctctccc ctggcgccct agtcgtcggg gtcgtgtgcg cagcgatact gcgtcggcac    4440

gtgggcccag gggagggggc tgtgcagtgg atgaaccggc tgatagcgtt cgcttcgcgg    4500

ggtaaccacg tctcccccac gcactatgtg cctgagagcg acgctgcagc acgtgtcact    4560

cagatcctct ctagtcttac catcactcag ctgctgaaga ggcttcacca gtggatcaac    4620

gaggactgct ccacgccatg ctccggctcg tggctaagag atgtttggga ttggatatgc    4680

acggtgttga ctgatttcaa gacctggctc cagtccaagc tcctgccgcg attgccggga    4740

gtccccttct tctcatgtca acgtgggtac aagggagtct ggcggggcga cggcatcatg    4800
```

```
caaaccacct gcccatgtgg agcacagatc accggacatg tgaaaaacgg ttccatgagg    4860

atcgtggggc ctaggacctg tagtaacacg tggcatggaa cattccccat taacgcgtac    4920

accacgggcc cctgcacgcc ctccccggcg ccaaattatt ctaggcgct gtggcgggtg    4980

gctgctgagg agtacgtgga ggttacgcgg gtgggggatt tccactacgt gacgggcatg    5040

accactgaca acgtaaagtg cccgtgtcag gttccggccc ccgaattctt cacagaagtg    5100

gatggggtgc ggttgcacag gtacgctcca gcgtgcaaac ccctcctacg ggaggaggtc    5160

acattcctgg tcgggctcaa tcaatacctg gttgggtcac agctcccatg cgagcccgaa    5220

ccggacgtag cagtgctcac ttccatgctc accgacccct cccacattac ggcggagacg    5280

gctaagcgta ggctggccag gggatctccc ccctccttgg ccagctcatc agctagccag    5340

ctgtctgcgc cttccttgaa ggcaacatgc actacccgtc atgactcccc ggacgctgac    5400

ctcatcgagg ccaacctcct gtggcggcag gagatgggcg ggaacatcac ccgcgtggag    5460

tcagaaaata aggtagtaat tttggactct ttcgagccgc tccaagcgga ggaggatgag    5520

agggaagtat ccgttccggc ggagatcctg cggaggtcca ggaaattccc tcgagcgatg    5580

cccatatggg cacgcccgga ttacaaccct ccactgttag agtcctggaa ggacccggac    5640

tacgtccctc cagtggtaca cgggtgtcca ttgccgcctg ccaaggcccc tccgatacca    5700

cctccacgga ggaagaggac ggttgtcctg tcagaatcta ccgtgtcttc tgccttggcg    5760

gagctcgcca caaagacctt cggcagctcc gaatcgtcgg ccgtcgacag cggcacggca    5820

acggcctctc ctgaccagcc ctccgacgac ggcgacgcgg gatccgacgt tgagtcgtac    5880

tcctccatgc cccccttga ggggagccg ggggatcccg atctcagcga cgggtcttgg    5940

tctaccgtaa gcgaggaggc tagtgaggac gtcgtctgct gctcgatgtc ctacacatgg    6000

acaggcgccc tgatcacgcc atgcgctgcg gaggaaacca agctgcccat caatgcactg    6060

agcaactctt tgctccgtca ccacaacttg gtctatgcta caacatctcg cagcgcaagc    6120

ctgcggcaga agaaggtcac ctttgacaga ctgcaggtcc tggacgacca ctaccgggac    6180

gtgctcaagg agatgaaggc gaaggcgtcc acagttaagg ctaaacttct atccgtggag    6240

gaagcctgta agctgacgcc cccacattcg gccagatcta aatttggcta tggggcaaag    6300
```

```
gacgtccgga acctatccag caaggccgtt aaccacatcc gctccgtgtg gaaggacttg    6360

ctggaagaca ctgagacacc aattgacacc accatcatgg caaaaaatga ggttttctgc    6420

gtccaaccag agaaggggggg ccgcaagcca gctcgcctta tcgtattccc agatttggggg   6480

gttcgtgtgt gcgagaaaat ggccctttac gatgtggtct ccaccctccc tcaggccgtg    6540

atgggctctt catacggatt ccaatactct cctggacagc gggtcgagtt cctggtgaat     6600

gcctggaaag cgaagaaatg ccctatgggc ttcgcatatg acacccgctg ttttgactca     6660

acggtcactg agaatgacat ccgtgttgag gagtcaatct accaatgttg tgacttggcc     6720

cccgaagcca gacaggccat aaggtcgctc acagagcggc tttacatcgg gggccccctg     6780

actaattcta aagggcagaa ctgcggctat cgccggtgcc gcgcgagcgg tgtactgacg     6840

accagctgcg gtaataccct cacatgttac ttgaaggccg ctgcggcctg tcgagctgcg     6900

aagctccagg actgcacgat gctcgtatgc ggagacgacc ttgtcgttat ctgtgaaagc     6960

gcggggaccc aagaggacga ggcgagccta cgggccttca cggaggctat gactagatac     7020

tctgcccccc ctggggaccc gcccaaacca gaatacgact tggagttgat aacatcatgc     7080

tcctccaatg tgtcagtcgc gcacgatgca tctggcaaaa gggtgtacta tctcacccgt      7140

gaccccacca cccccccttgc gcgggctgcg tgggagacag ctagacacac tccagtcaat      7200

tcctggctag gcaacatcat catgtatgcg cccaccttgt gggcaaggat gatcctgatg     7260

actcatttct tctccatcct tctagctcag gaacaacttg aaaaagccct agattgtcag       7320

atctacgggg cctgttactc cattgagcca cttgacctac ctcagatcat tcaacgactc       7380

catggcctta gcgcattttc actccatagt tactctccag gtgagatcaa tagggtggct       7440

tcatgcctca ggaaacttgg ggtaccgccc ttgcgagtct ggagacatcg ggccagaagt       7500

gtccgcgcta ggctactgtc ccaggggggg agggctgcca cttgtggcaa gtacctcttc       7560

aactgggcag taaggaccaa gctcaaactc actccaatcc cggctgcgtc ccagttggat       7620

ttatccagct ggttcgttgc tggttacagc gggggagaca tatatcacag cctgtctcgt       7680

gcccgacccc gctggttcat gtggtgccta ctcctacttt ctgtaggggt aggcatctat       7740

ctactcccca accgatgaac ggggagctaa acactccagg ccaataggcc atcctgtttt       7800
```

```
tttccctttt tttttttctt ttttttttttt ttttttttttt ttttttttttt ttctcctttt      7860

tttttcctct tttttttcctt ttctttcctt tggtggctcc atcttagccc tagtcacggc      7920

tagctgtgaa aggtccgtga ccgcttgac tgcagagagt gctgatactg gcctctctgc      7980

agatcaagta ct                                                          7992


<210>   6
<211>   7992
<212>   DNA
<213>   Artificial Sequence

<220>
<223>   HCVR24 subgenomic HCV replicon

<400>   6
gccagccccc gattgggggc gacactccac catagatcac tcccctgtga ggaactactg      60

tcttcacgca gaaagcgtct agccatggcg ttagtatgag tgtcgtgcag cctccaggac      120

ccccctccc gggagagcca tagtggtctg cggaaccggt gagtacaccg gaattgccag      180

gacgaccggg tcctttcttg gatcaacccg ctcaatgcct ggagatttgg gcgtgccccc      240

gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtact gcctgatagg      300

gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcacg aatcctaaac      360

ctcaaagaaa aaccaaaggg cgcgccatga ttgaacaaga tggattgcac gcaggttctc      420

cggccgcttg ggtggagagg ctattcggct atgactgggc acaacagaca atcggctgct      480

ctgatgccgc cgtgttccgg ctgtcagcgc aggggcgccc ggttcttttt gtcaagaccg      540

acctgtccgg tgccctgaat gaactgcagg acgaggcagc gcggctatcg tggctggcca      600

cgacgggcgt tccttgcgca gctgtgctcg acgttgtcac tgaagcggga agggactggc      660

tgctattggg cgaagtgccg gggcaggatc tcctgtcatc tcaccttgct cctgccgaga      720

aagtatccat catggctgat gcaatgcggc ggctgcatac gcttgatccg gctacctgcc      780

cattcgacca ccaagcgaaa catcgcatcg agcgagcacg tactcggatg gaagccggtc      840

ttgtcgatca ggatgatctg gacgaagagc atcaggggct cgcgccagcc gaactgttcg      900

ccaggctcaa ggcgcgcatg cccgacggcg aggatctcgt cgtgacccat ggcgatgcct      960
```

```
gcttgccgaa  tatcatggtg  gaaaatggcc  gcttttctgg  attcatcgac  tgtggccggc     1020

tgggtgtggc  ggaccgctat  caggacatag  cgttggctac  ccgtgatatt  gctgaagagc     1080

ttggcggcga  atgggctgac  cgcttcctcg  tgctttacgg  tatcgccgct  cccgattcgc     1140

agcgcatcgc  cttctatcgc  cttcttgacg  agttcttctg  agtttaaaca  gaccacaacg     1200

gtttccctct  agcgggatca  attccgcccc  tctccctccc  ccccccctaa  cgttactggc     1260

cgaagccgct  tggaataagg  ccggtgtgcg  tttgtctata  tgttattttc  caccatattg     1320

ccgtcttttg  gcaatgtgag  ggcccggaaa  cctggccctg  tcttcttgac  gagcattcct     1380

aggggtcttt  cccctctcgc  caaaggaatg  caaggtctgt  tgaatgtcgt  gaaggaagca     1440

gttcctctgg  aagcttcttg  aagacaaaca  acgtctgtag  cgaccctttg  caggcagcgg     1500

aaccccccac  ctggcgacag  gtgcctctgc  ggccaaaagc  cacgtgtata  agatacacct     1560

gcaaaggcgg  cacaacccca  gtgccacgtt  gtgagttgga  tagttgtgga  aagagtcaaa     1620

tggctctcct  caagcgtatt  caacaagggg  ctgaaggatg  cccagaaggt  accccattgt     1680

atgggatctg  atctggggcc  tcggtgcaca  tgctttacat  gtgtttagtc  gaggttaaaa     1740

aacgtctagg  ccccccgaac  cacggggacg  tggttttcct  ttgaaaaaca  cgataatacc     1800

atggcgccta  ttacggccta  ctcccaacag  acgcgaggcc  tacttggctg  catcatcact     1860

agcctcacag  gccgggacag  gaaccaggtc  gaggggagg  tccaagtggt  ctccaccgca     1920

acacaatctt  tcctggcgac  ctgcgtcaat  ggcgtgtgtt  ggactgtcta  tcatggtgcc     1980

ggctcaaaga  cccttgccgg  cccaaagggc  ccaatcaccc  aaatgtacac  caatgtggac     2040

caggacctcg  tcggctggca  agcgcccccc  ggggcgcgtt  ccttgacacc  atgcacctgc     2100

ggcagctcgg  acctttactt  ggtcacgagg  catgccgatg  tcattccggt  gcgccggcgg     2160

ggcgacagca  gggggagcct  actctccccc  aggcccgtct  cctacttgaa  gggctcttcg     2220

ggcggtccac  tgctctgccc  ctcggggcac  gctgtgggca  tctttcgggc  tgccgtgtgc     2280

acccgagggg  ttgcgaaggc  ggtggacttt  gtaccgtcg  agtctatgga  aaccactatg     2340

cggtccccgg  tcttcacgga  caactcgtcc  cctccggccg  taccgcagac  attccaggtg     2400

gcccatctac  acgcccctac  tggtagcggc  aagagcacta  aggtgccggc  tgcgtatgca     2460
```

```
gcccaagggt ataaggtgct tgtcctgaac ccgtccgtcg ccgccaccct aggtttcggg     2520

gcgtatatgt ctaaggcaca tggtatcgac cctaacatca gaaccggggt aaggaccatc     2580

accacgggtg cccccatcac gtactccacc tatggcaagt ttcttgccga cggtggttgc     2640

tctggggggcg cctatgacat cataatatgt gatgagtgcc actcaactga ctcgaccact     2700

atcctgggca tcggcacagt cctggaccaa gcggagacgg ctggagcgcg actcgtcgtg     2760

ctcgccaccg ctacgcctcc gggatcggtc accgtgccac atccaaacat cgaggaggtg     2820

gctctgtcca gcactggaga aatcccccttt tatggcaaag ccatccccat cgagaccatc     2880

aaggggggga ggcacctcat tttctgccat tccaagaaga aatgtgatga gctcgccgcg     2940

aagctgtccg gcctcggact caatgctgta gcatattacc ggggccttga tgtatccgtc     3000

ataccaacta gcggagacgt cattgtcgta gcaacggacg ctctaatgac gggctttacc     3060

ggcgatttcg actcagtgat cgactgcaat acatgtgtca cccagacagt cgacttcagc     3120

ctggacccga ccttcaccat tgagacgacg accgtgccac aagacgcggt gtcacgctcg     3180

cagcggcgag gcaggactgg tagggggcagg atgggcattt acaggtttgt gactccagga     3240

gaacggcccct cgggcatgtt cgattcctcg gttctgtgcg agtgctatga cgcgggctgt     3300

gcttggtacg agctcacgcc cgccgagacc tcagttaggt tgcgggctta cctaaacaca     3360

ccaggggttgc ccgtctgcca ggaccatctg gagttctggg agagcgtctt tacaggcctc     3420

acccacatag acgcccattt cttgtcccag actaagcagg caggagacaa cttcccctac     3480

ctggtagcat accaggctac ggtgtgcgcc agggctcagg ctccacctcc atcgtgggac     3540

caaatgtgga agtgtctcat acggctaaag cctacgctgc acgggccaac gccccctgctg     3600

tataggctgg gagccgttca aaacgaggtt actaccacac accccataac caaatacatc     3660

atggcatgca tgtcggctga cctggaggtc gtcacgagca cctgggtgct ggtaggcgga     3720

gtcctagcag ctctggccgc gtattgcctg acaacaggca gcgtggtcat tgtgggcagg     3780

atcatcttgt ccggaaagcc ggccatcatt cccgacaggg aagtccttta ccgggagttc     3840

gatgagatgg aagagtgcgc ctcacacctc ccttacatcg aacagggaat gcagctcgcc     3900

gaacaattca acagaaggc aatcgggttg ctgcaaacag ccaccaagca agcggaggct     3960
```

```
gctgctcccg tggtggaatc caagtggcgg accctcgaag ccttctgggc gaagcatatg   4020

tggaatttca tcagcgggat acaatattta gcaggcttgt ccactctgcc tggcaacccc   4080

gcgatagcat cactgatggc attcacagcc tctatcacca gcccgctcac cacccaacat   4140

accctcctgt ttaacatcct gggggggatgg gtggccgccc aacttgctcc tcccagcgct   4200

gcttctgctt tcgtaggcgc cggcatcgct ggagcggctg ttggcagcat aggccttggg   4260

aaggtgcttg tggatatttt ggcaggttat ggagcagggg tggcaggcgc gctcgtggcc   4320

tttaaggtca tgagcggcga gatgccctcc accgaggacc tggttaacct actccctgct   4380

atcctctccc ctggcgccct agtcgtcggg gtcgtgtgcg cagcgatact gcgtcggcac   4440

gtgggcccag gggaggggc tgtgcagtgg atgaaccggc tgatagcgtt cgcttcgcgg   4500

ggtaaccacg tctcccccac gcactatgtg cctgagagcg acgctgcagc acgtgtcact   4560

cagatcctct ctagtcttac catcactcag ctgctgaaga ggcttcacca gtggatcaac   4620

gaggactgct ccacgccatg ctccggctcg tggctaagag atgtttggga ttggatatgc   4680

acggtgttga ctgatttcaa gacctggctc cagtccaagc tcctgccgcg attgccggga   4740

gtccccttct tctcatgtca acgtgggtac aagggagtct ggcggggcga cggcatcatg   4800

caaaccacct gcccatgtgg agcacagatc accggacatg tgaaaaacgg ttccatgagg   4860

atcgtggggc ctaggacctg tagtaacacg tggcatggaa cattccccat taacgcgtac   4920

accacgggcc cctgcacgcc ctccccggcg ccaaattatt ctagggcgct gtggcgggtg   4980

gctgctgagg agtacgtgga ggttacgcgg gtgggggatt ccactacgt dacgggcatg   5040

accactgaca acgtaaagtg cccgtgtcag gttccggccc ccgaattctt cacagaagtg   5100

gatggggtgc ggttgcacag gtacgctcca gcgtgcaaac ccctcctacg ggaggaggtc   5160

acattcctgg tcgggctcaa tcaatacctg gttgggtcac agctcccatg cgagcccgaa   5220

ccggacgtag cagtgctcac ttccatgctc accgacccct cccacattac ggcggagacg   5280

gctaagcgta ggctggccag gggatctccc ccctccttgg ccagctcatc agctatccag   5340

ctgtctgcgc cttccttgaa ggcaacatgc actacccgtc atgactcccc ggacgctgac   5400

ctcatcgagg ccaacctcct gtggcggcag gagatgggcg gaacatcac ccgcgtggag   5460
```

```
tcagaaaata aggtagtaat tttggactct ttcgagccgc tccaagcgga ggaggatgag    5520

agggaagtat ccgttccggc ggagatcctg cggaggtcca ggaaattccc tcgagcgatg    5580

cccatatggg cacgcccgga ttacaaccct ccactgttag agtcctggaa ggacccggac    5640

tacgtccctc cagtggtaca cgggtgtcca ttgccgcctg ccaaggcccc tccgatacca    5700

cctccacgga ggaagaggac ggttgtcctg tcagaatcta ccgtgtcttc tgccttggcg    5760

gagctcgcca caaagacctt cggcagctcc gaatcgtcgg ccgtcgacag cggcacggca    5820

acggcctctc ctgaccagcc ctccgacgac ggcgacgcgg gatccgacgt tgagtcgtac    5880

tcctccatgc ccccccttga gggggagccg ggggatcccg atctcagcga cgggtcttgg    5940

tctaccgtaa gcgaggaggc tagtgaggac gtcgtctgct gctcgatgtc ctacacatgg    6000

acaggcgccc tgatcacgcc atgcgctgcg gaggaaacca agctgcccat caatgcactg    6060

agcaactctt tgctccgtca ccacaacttg gtctatgcta caacatctcg cagcgcaagc    6120

ctgcggcaga agaaggtcac ctttgacaga ctgcaggtcc tggacgacca ctaccgggac    6180

gtgctcaagg agatgaaggc gaaggcgtcc acagttaagg ctaaacttct atccgtggag    6240

gaagcctgta agctgacgcc cccacattcg gccagatcta aatttggcta tggggcaaag    6300

gacgtccgga acctatccag caaggccgtt aaccacatcc gctccgtgtg gaaggacttg    6360

ctggaagaca ctgagacacc aattgacacc accatcatgg caaaaaatga ggttttctgc    6420

gtccaaccag agaagggggg ccgcaagcca gctcgcctta tcgtattccc agatttgggg    6480

gttcgtgtgt gcgagaaaat ggccctttac gatgtggtct ccaccctccc tcaggccgtg    6540

atgggctctt catacggatt ccaatactct cctggacagc gggtcgagtt cctggtgaat    6600

gcctggaaag cgaagaaatg ccctatgggc ttcgcatatg acacccgctg ttttgactca    6660

acggtcactg agaatgacat ccgtgttgag gagtcaatct accaatgttg tgacttggcc    6720

cccgaagcca gacaggccat aaggtcgctc acagagcggc tttacatcgg gggccccctg    6780

actaattcta aagggcagaa ctgcggctat cgccggtgcc gcgcgagcgg tgtactgacg    6840

accagctgcg gtaataccct cacatgttac ttgaaggccg ctgcggcctg tcgagctgcg    6900

aagctccagg actgcacgat gctcgtatgc ggagacgacc ttgtcgttat ctgtgaaagc    6960
```

```
gcggggaccc aagaggacga ggcgagccta cgggccttca cggaggctat gactagatac    7020

tctgccccc ctggggaccc gcccaaacca gaatacgact tggagttgat aacatcatgc    7080

tcctccaatg tgtcagtcgc gcacgatgca tctggcaaaa gggtgtacta tctcacccgt    7140

gaccccacca cccccccttgc gcgggctgcg tgggagacag ctagacacac tccagtcaat    7200

tcctggctag gcaacatcat catgtatgcg cccaccttgt gggcaaggat gatcctgatg    7260

actcatttct tctccatcct tctagctcag gaacaacttg aaaaagccct agattgtcag    7320

atctacgggg cctgttactc cattgagcca cttgacctac ctcagatcat tcaacgactc    7380

catggcctta gcgcattttc actccatagt tactctccag gtgagatcaa tagggtggct    7440

tcatgcctca ggaaacttgg ggtaccgccc ttgcgagtct ggagacatcg ggccagaagt    7500

gtccgcgcta ggctactgtc ccagggggg agggctgcca cttgtggcaa gtacctcttc    7560

aactgggcag taaggaccaa gctcaaactc actccaatcc cggctgcgtc ccagttggat    7620

ttatccagct ggttcgttgc tggttacagc gggggagaca tatatcacag cctgtctcgt    7680

gcccgacccc gctggttcat gtggtgccta ctcctacttt ctgtaggggt aggcatctat    7740

ctactcccca accgatgaac ggggagctaa acactccagg ccaataggcc atcctgtttt    7800

tttcccttt tttttttctt ttttttttt ttttttttt ttttttttt ttctccttt    7860

tttttcctct tttttttcctt ttctttcctt tggtggctcc atcttagccc tagtcacggc    7920

tagctgtgaa aggtccgtga ccgcttgac tgcagagagt gctgatactg gcctctctgc    7980

agatcaagta ct                                                         7992


<210>    7
<211>    22
<212>    DNA
<213>    Artificial Sequence

<220>
<223>    RT-PCR primer for NS5B region between nt 7435 and 7750

<400>    7
gccctagatt gtcagatcta cg                                               22


<210>    8
```

```
<211>  22
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  RT-PCR primer for NS5B region between nt 7435 and 7750

<400>  8
ataaatccaa ctgggacgca gc                                           22


<210>  9
<211>  21
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  RT-PCR primer for NS5B region between 7360 and 7800

<400>  9
ccttgtgggc aaggatgatc c                                            21


<210>  10
<211>  23
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  RT-PCR primer for NS5B region between nt 7360 and 7800

<400>  10
gacaggctgt gatatatgtc tcc                                          23


<210>  11
<211>  22
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  RT-PCR primer for neo region between nt 650 and 1110

<400>  11
gttctttttg tcaagaccga cc                                           22


<210>  12
<211>  21
<212>  DNA
```

<213> Artificial Sequence

<220>
<223> RT-PCR primer for neo region between nt 650 and 1110

<400> 12
ccaccatgat attcggcaag c   21

<210> 13
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> RT primer for HCVR replicons

<400> 13
ctcgtatgtt gtgtggaa   18

<210> 14
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> RT primer for HCVR replicons

<400> 14
gtcgctctcg aggcacata   19